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植物研究雜誌

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Keisuke TUBAKI: **Cephaliophora irregularis newly found in Japan**

椿 啓 介*: 日本新発見の *Cephaliophora irregularis*

Cephaliophora irregularis Thaxter, a member of Hyphomycetes, is noted here as the third record in the world. This was isolated from Hattyo-Miso (Japanese bean-mash) by Dr. K. Saito, and given to the present writer for study.

Microscopical features of this species are unique among the members having hyalo-didymous spore-forms in the Moniliaceae. This species was at first observed by Thaxter (1903) on mouse dung at Porto Rico, and later with fifty year's intervals from the first record, Subramanian (1953) found this on the dead and decaying moist wood at Madras of India. However, on cultural observation was tried so long as I know. As shown by Subramanian, this species does not always be confined to a sort of substratum, although this has been recorded as fimicolous by Clements & Shear (1931) basing on the description by Thaxter.

Cephaliophora irregularis Thaxter, in Bot. Gaz. **35**: 158 (1903); Subramanian C. V., in Proc. Indian Acad. Science **37**: 96 (1953).

Growth on malt agar, floccose, rapid and luxuriant over the entire surface of the agar plate, with abundant aerial hyphae, at first white, then becoming to pale colour, pale pinkish or pale brownish colour; reverse except for agar pale brown coloured. Submerged hyphae thick-walled, producing irregular shaped chlamydospores intercalarly or terminally, variable in diam., 2.5–5.5 μ, pale brown coloured. Aerial hyphae trailing, irregularly branched, septate, thin-walled, often with hyphal-fusions, bearing conidiophores as side branches, 3.5–7.0 (9.0) μ in diam., hyaline or pale pinkish coloured. Conidiophores arise as lateral branches from aerial hyphae, sometimes at the tips of hyphae, commonly simple, septate, upward enlarged gradually or abruptly and broading into hemispherical or inversed conical vesicles on which 2–15 or more conidia are borne usually in dense capitate arrangement; often these vesicles may arise directly from aerial hypae. Conidiophores 20–50 μ long and 3.5–9.5 μ in diam., the vesicles 13–25 (30) μ in diam., at the widest place, pale pinkish coloured. Conidia produced basipetally, acrogenous in whorls on the entire surface of the swollen apex of conidiophores, sessile, smooth walled, uniseptate or biseptate, at first ovoid or pyriform, then the upper cells expand in broadwise or bilobed in Y-shape, assuming the characteristic shape when matured, with short foot, 30–40 (50) μ (30 μ in average) long, (15) 25–40 μ (35 μ in average) in diam. at broader parts, pale pinkish coloured, with brownish granular contents within upper cells; sometimes basal cells thick-walled. Abnormal conidia of different shape frequently found; at 25° C germination takes place rapidly, commonly from basal cells. Chlamydospores abundant on submerged hyphae, terminal or intercalar, single or catenulate, with much granular contents, variable in size and shape, commonly 5.5–9.0 (15) μ in diam.

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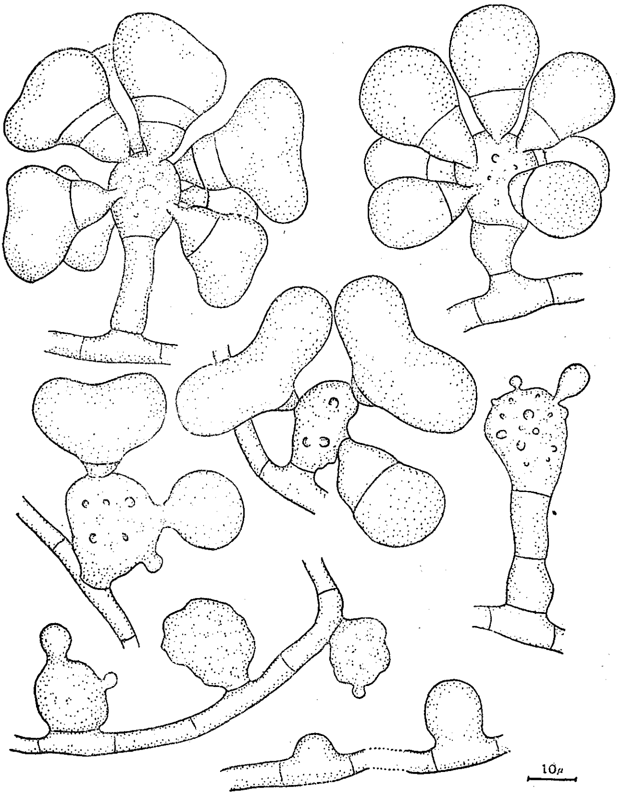

Fig. 1. *Cephaliophora irregularis.* Various stages of conidia and conidiophores.

Predaceous; capture soil-nematodes, kill and consume it by their capturing hyphae. These nematodes are captured by ascending hyphal branches which continue to grow, winding around the bodies of the captives as *Triposporina aphanopaga* does so. This mechanism is rather simpler than that of other predaceous fungi such as *Arthrobotrys*, *Dactyllela*, *Dactylium*, *Trichothecium* etc. and seems to capture only nematodes already weakened. It is interesting that this species resembles *Triposporina* also in shape of conidia.

On potato-agar, with more brownish coloured growth than on malt agar.

On Czapek-agar, growth scarce.

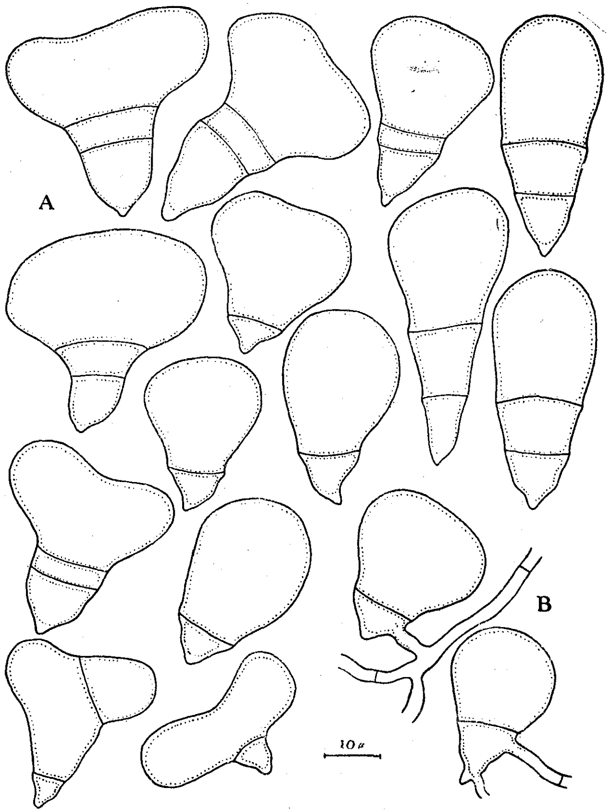

Fig. 2. *Cephaliophora irregularis.* A. Conidia, B. Germination of conidia.

Optimum temperature for the growth 25-28° C; at 37° C, very weak growth without producing conidia.

Starch hydrolyzed, gelatin liquefied.

Hab. Isolated by Dr. K. Saito from Hattyo-Miso (Japanese bean-mash), Okazaki, Aiti Pref. Japan (1949).

In the appearances, colour of the growth and in the hyalo-didymous conidia occurring in whorls around the swollen parts of conidiophores, this species resembles the members of *Arthrobotrys*, differing, however, the Y-shaped conidia produced not from swollen intercalary cells which are characteristic form of the latter genus, but from the tips of conidiophores.

Thaxter also described another species, *C. tropica* Thaxter, the type of the genus, on mongoose dung, and this was reported again by Crook & Hindson on painted stainless steel panals in Australia (Trans. Brit. Myc. Soc. **38**: 218. 1955). According to the original description, conidia of *C. tropica* are two to five-septate (normally three septate) and cylindrical, but the Australian record shows that the conidia are often bilobed resembling those of the present species. Frequently the conidia of *C. irregularis* become elongated. The length of conidiophores of it was shown to be 52–120 μ by Subramanian, whereas in my fungus it ranges 20–50 μ and shorter than that of *C. tropica* which was described to be 60–75 μ long by Thaxter.

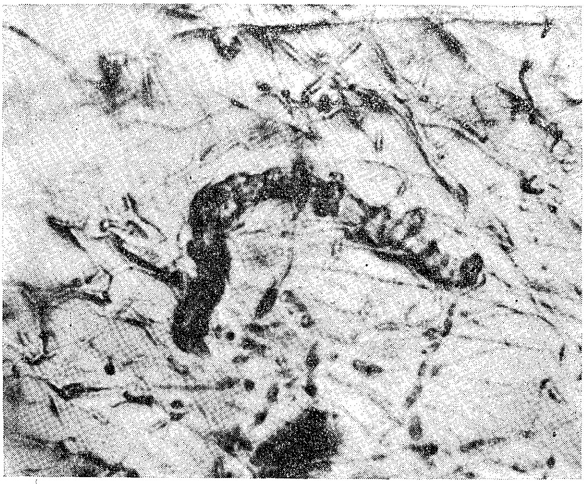

Fig. 3' An eelworm, captured ane killed by hyphae of *Cephaliophora irregularis* (ca. ×100)

After all, the difference of two species is not so distinct. In further comparative studies, *Cephaliophora irregularis* might be taken as a variant of the type species, *C. tropica*.

Culture is kept in Nagao Institute of Tokyo as Japanese Type Culture Collection.

I wish to [express my thanks to Dr. K. Saito for supplying the cultures, to Dr. K. Kominami and Dr. Y. Kobayasi for their constant guidances in this course, and also to Dr. S. J. Hughes, Botany & Plant Lab., Ottawa, Canada, who suggested me to pursue this work.